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The object of the present invention is to provide a WDM optical communication system and a WDM communication method wherein deviation of transmission characteristics of optical signals of respective wavelengths is reliably controlled, based on reception information such as the OSNR, BER and the like measured at the receiving end, thereby enabling optimal transmission conditions to be realized. For this purpose, the present WDM optical communication system transmits WDM signal light of wavelengths  $\lambda_1 \sim \lambda_n$ , which has been generated by the transmitting end of one terminal station, to the receiving end of the other terminal station through an optical transmission path. At the receiving end, the OSNR and BER of the optical signals of wavelengths  $\lambda_1 \sim \lambda_n$  are measured, and the result is superimposed on overhead information transmitted along the opposing line of the optical transmission path as reception information. At the transmitting end, the settings of pre-emphasis and a parameter  $\alpha$  are feedback controlled based on the reception information about each wavelength transmitted, and deviation of transmission characteristics of respective wavelengths is thus suppressed.